

00/087/60
JC893 U.S. PTO
2000-09-18***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE***

Applicant: Nobuhisa YODA *et al.*
Title: INFORMATION INPUT DEVICE
Appl. No.: Not yet assigned
Filing Date: September 18, 2000
Examiner: Not yet assigned
Art Unit: Not yet assigned

JC893 U.S. PTO
09/664/71
09/18/00
00/087/60**UTILITY PATENT APPLICATION
TRANSMITTAL**

Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, D.C. 20231

Sir:

Transmitted herewith for filing under 37 C.F.R. § 1.53(b) is the nonprovisional utility patent application of:

Nobuhisa YODA
Tatsuya HARAGUCHI

Enclosed are:

- Specification, Claim(s), and Abstract (60 pages)
- Formal drawings (16 sheets, Figures 1-20)
- Declaration and Power of Attorney (2 pages)
- Associate Power of Attorney
- Assignment to TOSHIBA TEC KABUSHIKI KAISHA
- Assignment Recordation Form Cover Sheet
- Proprietary Information Disclosure Statement (filed under seal) with attached Transmittal
- Information Disclosure Statement

Form PTO-1449 with a copy of each of the 2 listed reference(s)

Claim for Convention Priority

Certified copy of priority document (Japanese Patent Application No. 11-301400 filed October 22, 1999)

The filing fee is calculated below:

	Claims as Filed	Included in Basic Fee	Extra Claims	Rate	Fee Totals
Basic Fee				\$690.00	\$690.00
Total Claims:	10	- 20	= 0	x \$18.00	= 0.00
Independents:	1	- 3	= 0	x \$78.00	= 0.00
If any Multiple Dependent Claim(s) present:				+ \$260.00	= 0.00
Assignment Recordation Fee				+ \$40.00	= \$40.00
				SUBTOTAL:	= \$730.00
<input type="checkbox"/> Small Entity Fees Apply (subtract 1/2 of above):				=	\$0.00
				TOTAL FILING FEE:	= \$730.00

A check to cover the \$730.00 filing fee is enclosed.

The required filing fees are not enclosed but will be submitted in response to the Notice to File Missing Parts of Application.

The Assistant Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Assistant Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney at the address indicated below.

Respectfully submitted,

By Johnny A. Kumar

Date: September 18, 2000

FOLEY & LARDNER
3000 K Street, N.W., Suite 500
P.O. Box 25696
Washington, D.C. 20007-8696
Telephone: (202) 672-5300
Facsimile: (202) 672-5399

Johnny A. Kumar
Attorney for Applicant
Registration No. 34,649

TITLE OF THE INVENTION

INFORMATION INPUT DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 11-301400, filed October 22, 1999, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

10 This invention relates to an information input device, such as a scanner, incorporated in a digital copy machine connected to a network, for scanning images on a document, registering, in a database, the images, and retrieving the images registered in the database.

15 There is a conventional information input device, such as a scanner connected to a network, which has a function of reading document images, registering them in a storage, and retrieving the registered images. 20 For example, a digital copy machine connected to a network can be used as an information input device having such a function. This digital copy machine reads document images using its scanner section for reading images, and registers the read images in a 25 server connected to the network. At this time, the digital copy machine registers the document images and also attribute information corresponding thereto. On

the basis of, for example, the attribute information, the document images registered in the server are retrieved.

Japanese Patent Application KOKAI Publication

5 No. 10-312456 discloses a technique for realizing such a function. When, in this technique, a start button incorporated in a digital copy machine has been turned on, image input means and attribute information creating means incorporated in the machine create image data and attribute information, respectively. The image data and the attribute information are transferred by transfer means to storage means incorporated in that server on a network, to which a network address stored in the address storage means of 10 the digital copy machine is assigned. The image data and the attribute information are published by publishing means incorporated in the server, and can be accessed through, for example, the access means of a data-retrieving personal computer on the network.

15

20 Further, there is a technique for reading a document while attaching a header sheet and a trailer sheet thereto, and registering the document in an image database and information concerning the document in a registry database.

25 Japanese Patent Application KOKAI Publication No. 62-267876 discloses a technique for realizing this function. This technique relates to an image

001300 4074-001300 001300

registering system for use in an image file apparatus
for registering document images. The image file
apparatus comprises a registry database for retrieving
a registered document, an image database storing images
5 on each registered document, a registry matter database
registering connection data to be used for making the
registry database correspond to the image database,
input means for inputting a document to obtain image
data corresponding thereto, recognition means for
10 recognizing alphanumeric characters or other signs from
image data, and control means for controlling the
aforementioned databases, the input means and the
recognition means so as to process data. When
registering images on a document, a header sheet and a
15 trailer sheet are respectively provided before the
front cover and after the back cover of the document
that is in the form of a composite volume and has its
pages arranged in ascending order or in descending
order, or before the front cover and after the back
cover of a document that is in the form of sheets
20 including common data. The header sheet has at least
first, second and third symbol frames -- the first
symbol frame that records a symbol indicating whether
the document is in the form of a composite volume or in
25 the form of slips, a symbol indicating whether data is
printed on both sides of each page of the document or
on one side thereof, a symbol indicating a front side

00030100-T7045960

or a back side when data is printed on both sides of each page of the document, or a symbol indicating whether the document pages are arranged in ascending order or in descending order; at least two second symbol frames that record the classification or document number of the document pages; and the third symbol frame that records a symbol indicating whether the sheet is the header sheet or the trailer sheet --. The header sheet, the document in the form of a composite volume or in the form of slips, and the trailer sheet are input in this order via the input means, and the symbols recorded in the symbol frames recognized by the recognition means, thereby making documents, stored in the registry database and the image database, correspond to each other.

In the above-described prior techniques, it is necessary to individually execute processing for registering document images in a voluntarily selected folder, and processing for registering, into a full-text-search database, the result of character recognition processing (OCR processing) executed on the registered document images. Thus, OCR processing is executed after images on each document are registered. Therefore, it is troublesome to execute document image registration and character recognition processing for retrieving document images.

Moreover, when, in the prior technique, executing

OCR processing to retrieve a registered document image, operation buttons for setting conditions to increase the efficiency of OCR processing cannot be prepared in advance for various types of document images.

5 Accordingly, when executing OCR processing, an operation button suitable for each document image cannot be selected.

As described above, when, in the prior art, automatically executing OCR processing on scanned 10 document images, the user must operate various setting means for enhancing OCR processing, in addition to the scanning/inputting operation of document images. This means that time and effort are required for correction executed after the scanning operation, and high 15 character recognizing accuracy cannot be obtained.

BRIEF SUMMARY OF THE INVENTION

Since, when automatically executing the character 20 recognition processing as described above, various types of setting means for enhancing character recognition processing are separated from document image input means, time and effort are required to register a document image or to execute correction after scanning the document image, and/or appropriate character recognition accuracy cannot be obtained. The 25 present invention has been developed to solve these problems, and aims to provide an information input device which is easy for the user to use and capable of

DOCUMENT NUMBER

efficiently retrieving a registered document image with maximum character recognition accuracy.

To attain the aim, there is provided an information input device comprising: an image reading section for reading images on each of documents; a character recognition section for subjecting, to character recognition processing, the images read by the image reading section; a display section for displaying various types of instruction buttons; a management section for managing set contents corresponding to each of the instruction buttons displayed on the display section, the set contents including a destination of registration of the images read by the image reading section, and contents of processing executed on the images by the character recognition section; and a control section for executing control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to the one of the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling the character recognition section so as to execute character recognition processing on the read images, and simultaneously registering the read images and a result of character recognition processing executed on the read images.

Additional objects and advantages of the invention

00018000-001071-00000000

will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and 5 obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of the specification, 10 illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

15 FIG. 1 is a schematic block diagram illustrating a network system to which first to seventh embodiments of the invention are applicable;

20 FIG. 2 is a schematic block diagram illustrating another network system to which the first to seventh embodiments of the invention are applicable;

FIG. 3 is a view showing an example of a display screen displaying instruction buttons;

FIG. 4 is a view showing an example of a display screen displaying other instruction buttons;

25 FIG. 5 is a view illustrating an example of a display screen for preparing an instruction button;

FIG. 6 is a flowchart illustrating the flow of

09654071-0001800

processing executed in the first embodiment of the invention;

FIG. 7 is a view showing an example of a display screen displaying other instruction buttons;

5 FIG. 8 is a view useful in explaining the contents of a management table;

FIG. 9 is a view illustrating an example of a display screen for preparing an instruction button for each purpose;

10 FIG. 10 is a view showing an example of a screen for retrieving a document image;

FIG. 11 is a flowchart illustrating the flow of processing executed in the second embodiment of the invention;

15 FIG. 12 is a flowchart illustrating the flow of processing executed in the third embodiment of the invention;

FIG. 13 is a flowchart illustrating the flow of processing executed in the fourth embodiment of the invention;

20 FIG. 14 is a flowchart illustrating the flow of processing executed in the fifth embodiment of the invention;

FIG. 15 is a flowchart illustrating the flow of processing executed in the sixth embodiment of the invention;

FIG. 16 is a view illustrating an example of a

09654074-001800

printed page for confirming a processing result;

FIG. 17 is a flowchart illustrating the flow of processing executed in the seventh embodiment of the invention;

5 FIG. 18 is a schematic block diagram illustrating another network system according to the first to seventh embodiments of the invention;

FIG. 19 is a flowchart illustrating the flow of processing executed in an eighth embodiment of the invention; and

10 FIG. 20 is a view showing an example of data stored in an operation log.

DETAILED DESCRIPTION OF THE INVENTION

First to eighth embodiments of the invention will be described with reference to the accompanying drawings.

FIGS. 1 and 2 show examples of network systems which include an information input device according to each of first to eighth embodiments of the invention.

20 Each network system comprises a network scanner (digital copier) 1 as an information input device, a personal computer for data retrieval (external device) 2, a document management server 3, and a LAN 4.

As shown in FIG. 1, the network scanner 1 includes a control section 11, an image input section (image reading section) 12, an OCR processing section (character recognition section) 13, a display 14, a

00810000-1074-0064071

management section 15, a memory 16, etc. The network scanner 1 is a device for scanning images on a document made of, for example, paper, to create electronic image data.

5 The control section 11 controls the entire scanner. The image input section 12 optically scans a document made of, for example, paper to thereby read images thereon. The OCR processing section 13 executes character recognizing processing (OCR processing) on a 10 character or a symbol from the read images. The display 14 is provided on an operation panel (not shown) and contains a touch panel 14a. The display 14 displays guidance on operation, the set contents, or instruction buttons for inputting operation 15 instructions. The management section 15 has a management table 15a for managing, for example, the set contents for designating processing assigned to each instruction button. The memory 16 temporarily stores various types of data, or stores image data, text data, etc. transmitted from an external device via a network. 20

Although the network scanner 1 corresponds to the image input device in FIG. 1, it may be a device, such as a digital copy machine 1 as shown in FIG. 2, which has an image input function, a printing function, etc. 25 In this case, as shown in FIG. 2, the digital copy machine 1 mainly includes a printer section 17 for forming an image on an image forming medium such as a

003160-745960

copy sheet of paper, in addition to the structural elements of the network scanner shown in FIG. 1.

5 The network scanner (digital copy machine) 1 is connected to a LAN 4, to which a document management server 3 and a personal computer 2 for data retrieval are connected. The personal computer 2 has a display 2a, an operation section, etc., and is used to retrieve document images from the document management server 3.

10 The document management server 3 is a device for storing and managing document images input from the network scanner 1. The document management server 3 includes an image database (DB) 32 for managing images using folders, and a full-text-search database (DB) 31 for storing text data. The image database 32 manages 15 each document image as a document metaphor in a folder, and folders used therein are arranged in a tree structure.

20 The full-text-search database 31 stores text data which comprises character codes indicating characters or character candidates, and which are obtained as a result of OCR processing executed on images. The text data stored in the full-text-search database 31 is used 25 when the personal computer 2 executes data retrieval depending upon whether or not a keyword is included in the text data.

The first embodiment of the invention will now be described.

FIG. 3 shows an example of a display screen of the display 14 of the network scanner 1, which displays instruction buttons realized by the touch panel 14a. In this example, the display 14 displays four 5 instruction buttons 51 - 54, a read start button 55 for inputting an instruction to start image reading, and operation guidance.

The instruction buttons 51 - 54 are used to input 10 an instruction to execute processing based on the set contents managed by the management table 15a. Specifically, when each of the instruction buttons 51 - 15 54 has been touched, images on a document are scanned and input (read) on the basis of the set contents in the management table 15a, thereby executing COR processing on the input images and registering the input images and the OCR processing result.

The instruction button 51 is labeled "BUSINESS 20 DAILY REPORT (FRONT COVER OCR)". This button is used to execute the process of registering the images on a scanned document in a folder labeled "BUSINESS DAILY REPORT" and contained in the image database 32, and the process of executing OCR processing on only the front cover (1 page) of the scanned document and then 25 registering the OCR processing result in the full-text-search database 31.

Accordingly, when the instruction button 51 is touched, images on the scanned document are registered

090564074 001300

as images on a new document in the folder labeled "BUSINESS DAILY REPORT", and also subjected to OCR processing. This processing result is registered in the full-text-search database 31.

5 The instruction button 52 is labeled "BUSINESS COST ESTIMATION (ALL PAGE OCR)". This button is used to register images on a scanned document as images on a new document in the folder labeled "BUSINESS COST ESTIMATION (ALL PAGE OCR)", and execute OCR processing 10 on all pages of the document, thereby registering the OCR processing result in the full-text-search database 31.

15 The instruction button 53 is labeled "CHECKOUT RECEIPT (FRONT COVER OCR)" and used to register a checkout receipt. This button is used to register images on a scanned document as images on a new document in a folder labeled "CHECKOUT RECEIPT", and executes OCR processing on only the front cover 20 (1 page) of the scanned document and then registering the OCR processing result in the full-text-search database 31.

25 The instruction button 54 is labeled "CUSTOMER MAP (FRONT COVER OCR)" and used to register a customer map in the same manner as in the case of the instruction buttons 51 - 53. This button is used to register images on a scanned document as images on a new document in a folder labeled "CUSTOMER MAP", and

09654074-001800

executes OCR processing on only the front cover
(1 page) of the scanned document and then registering
the OCR processing result in the full-text-search
database 31.

5 Further, as shown in FIG. 3, a lower left portion
of the display screen displays an instruction message
for the user. In the example shown in FIG. 3, the
operation guidance "please set a document and push the
process button to start its reading" is displayed. In
10 addition, the instruction button 55 labeled "START
READING" to start reading of document images and to
register them on the basis of the set contents in the
selected process button is provided at a lower right
portion of the display screen.

15 Using the above display screen, the user selects
one of the instruction buttons 51 - 54 in accordance
with a destination into which a to-be-input document
should be registered, and pushes the instruction button
55 to start the process. The range of pages of a to-
20 be-read document, which are subjected to OCR processing,
is set in the management table 15a of the management
section 15 for each destination of registration
corresponding to the instruction buttons 51 - 54.

25 FIG. 4 shows an example of a display screen at
which an appropriate instruction button can be selected
in accordance with the language or the font of the
printed characters of a to-be-input document. As shown

in FIG. 4, instruction buttons 61 - 64 are supposed to be selectively used when the destination folder in which a to-be-scanned document is registered is a "CONTRACT DOCUMENT". The procedure after the document 5 is set and until it is registered is similar to that shown in FIG. 2.

If, for example, the to-be-scanned contract document is written in Japanese, and the character pitch is fixed, the instruction button 61 labeled "JAPANESE; FIXED PITCH" is selected. In the case of a Japanese contract document using a character pitch other than the fixed one, the instruction button 62 10 labeled "JAPANESE; STANDARD PITCH" is selected.

On the other hand, if the to-be-scanned contract 15 document is written in English, and the letter pitch is proportional, the instruction button 63 labeled "ENGLISH; PROPORTIONAL" is selected. In the case of an English contract document using a fixed letter pitch, the instruction button 64 labeled "ENGLISH; FIXED FONT" 20 is selected.

Selection of an instruction button suitable for the feature of a to-be-input document enables OCR processing suitable for input document images, thereby enhancing the efficiency of recognition of characters 25 (letters).

In the first embodiment, the instruction buttons, which are realized on the display 14 using the touch

panel 14a, can be prepared voluntarily by the user, using a preparation screen. FIG. 5 illustrates an example of data input in an instruction button preparation screen. More specifically, FIG. 5 shows a preparation screen for preparing the "BUSINESS DAILY REPORT" button shown in FIG. 3. The contents set for the instruction button using the preparation screen are written as the attribute data of the button into the management table 15a of the management section 15, and managed by it.

As is shown in FIG. 5, the preparation screen of the instruction button displays setting items such as "PANEL NAME", "BUTTON NAME", "REGISTRATION DESTINATION FOLDER NAME", "WHETHER OR NOT OCR PROCESSING IS EXECUTED", "DICTIONARY USED FOR CHARACTER RECOGNITION", "PRINTING FOR CONFIRMATION", "DOCUMENT SEPARATOR RECOGNITION", "DOCUMENT AUTOMATIC SEPARATION", "LANGUAGE FOR OCR SETTING", "CHARACTER PITCH FOR OCR SETTING", "RANGE OF PROCESSING FOR OCR SETTING", etc.

The item "PANEL NAME" is for setting the name of a panel (the name of a display screen) to which the to-be-prepared instruction button belongs. The item "BUTTON NAME" is for setting the name of the to-be-prepared instruction button, and the button name is displayed as the instruction button.

The item "REGISTRATION DESTINATION FOLDER NAME" is set for designating the name of a folder in which

09654074-0091800

images input using a selected instruction button are registered. The item "WHETHER OR NOT OCR PROCESSING IS EXECUTED" designates whether or not the input document images should be subjected to OCR processing.

5 The item "DICTIONARY USED FOR CHARACTER RECOGNITION" is set for designating a dictionary to be used in the case of executing OCR processing. The item "PRINTING FOR CONFIRMATION" is set for designating whether or not a registered document image should be printed for confirmation. The item "DOCUMENT SEPARATOR RECOGNITION" is set for designating whether or not the end of each of a plurality of documents input at one time should be automatically recognized by recognizing each separator.

10 The item "DOCUMENT AUTOMATIC SEPARATION" is set for designating whether or not the documents should be automatically separated and registered when a separator has been detected. The items "LANGUAGE FOR OCR SETTING", "CHARACTER PITCH FOR OCR SETTING" and "RANGE OF PROCESSING FOR OCR SETTING" are set for designating the language, the character pitch and the range of the to-be-processed pages of the document as configuration elements for OCR processing, respectively.

15 FIG. 6 is a flowchart useful in explaining processing executed in the first embodiment. Specifically, FIG. 6 illustrates the flow of processing executed from the scanning of a document to the

008T60-T2049360

registration of its images in a folder in accordance with an instruction using an instruction button as shown in FIG. 3 or 4.

First, the user designates the name of a panel (the name of a display screen) to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons (step ST1). Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST2).

The control section 11 then sets a configuration for inputting images on the basis of data read from the management table 15a (step ST3). After the user touches the read start button, the control section 11 starts input of images through the image input section 12 (step ST4).

Further, the control section 11 sets a configuration (mode) for OCR processing on the basis of the set contents of the selected instruction button, which concern OCR processing and are read from the management table 15a of the management section 15 (step ST5). Upon inputting images, the control section 11 executes OCR processing on the input images under the set OCR processing configuration (step ST6).

At this time, the range of execution of OCR processing is determined based on the contents set in the management table 15a. For example, the range of execution of OCR processing, such as the full text (all 5 pages), only the front cover (the first page), or pages between designated pages, is set for a plurality of read images.

After OCR processing is executed on the read images, the control section 11 registers them in a folder contained in the image database 32 and designated in the management table 15a in accordance with the selected instruction button (step ST7). Subsequently, the control section 11 registers, in the full-text-search database 31, text data (a text 10 document) resulting from OCR processing, together with information indicating the image storing place (folder) 15 (step ST8).

After registering the OCR processing result and the images, the control section 11 writes the 20 processing result into an operation log table 15b described later (step ST9), and finishes the process related to the selected instruction button.

As described above, the invention is characterized by the instruction button that is provided for 25 simultaneously executing, for a document scanned by one scanning operation, registration, in the full-text-search database, data obtained by subjecting images on

008160709960

the document to OCR processing, and registration of the images on the document in a data retrieving database of a folder tree structure after designation of a folder as a destination of registration.

5 Thus, registration of read images in a folder and registration of text data obtained by executing OCR processing on the read images can be simultaneously executed using one instruction button.

10 Moreover, when retrieving a registered document, even if character recognition is executed partially erroneously during the execution of OCR processing, it does not significantly influence the retrieval of the document and hence the retrieval can be executed efficiently, since a keyword for retrieval is searched 15 over the entire text data.

Also, in addition to the full text search of the text data by OCR processing, document images can be also retrieved by folder retrieval. This enables the entire system to reliably retrieve document images.

20 A second embodiment of the invention will now be described.

In the second embodiment, a dictionary used during character recognition processing is assigned to an instruction button. This enables recognition of 25 characters on a scanned document using an optimal dictionary for the document based on the instruction button touched by the user when scanning the document.

In OCR processing, a method (sentence analysis method) for analyzing, in addition to recognition processing for analyzing the shape of each character, a word or a sentence constructed by recognized characters 5 to select an optimal one of character candidates is often employed in order to finally correctly recognize each character. In this sentence analysis method, it is important to use a dictionary corresponding to the contents of a to-be-recognized document.

10 For example, in a document reciting addresses or expertise information concerning, for example, medical practice, many unusual words are used, and hence it is possible that the document will not correctly be recognized if a usual dictionary is used. If, in this 15 case, a dictionary corresponding to the document is used, the efficiency of recognition can be enhanced.

FIG. 7 shows an example of a display screen displaying instruction buttons 71 - 74 that correspond to respective dictionaries used when input document 20 images are subjected to OCR processing. If the instruction button 71 labeled "CLIENT REGISTRATION" is used when scanning a document such as an address list, characters of the address list are recognized using a dictionary concerning addresses and names. Further, 25 when scanning a management document using the instruction button 72 labeled "MANAGEMENT DOCUMENT REGISTRATION", a dictionary concerning management or

00814074-0094960

economy is used.

The instruction buttons 71 - 74 shown in FIG. 7 are managed by a management table 15a as shown in FIG. 8. As shown in FIG. 8, the management table 15a stores items used for OCR processing, such as "BUTTON NUMBER", "BUTTON NAME", "PRINTING FOR CONFIRMATION", "SEPARATOR RECOGNITION", "DOCUMENT SEPARATION", "USED DICTIONARY", "OCR LANGUAGE", "OCR PITCH" and "OCR TARGET RANGE".

10 The item "USED DICTIONARY" is used to designate dictionaries corresponding to respective documents. For example, a dictionary concerning names and addresses is set for the instruction button 71 labeled "CLIENT REGISTRATION". Similarly, a dictionary 15 concerning management and economy is set for the instruction button 72 labeled "MANAGEMENT DOCUMENT REGISTRATION". A dictionary concerning architecture is set for the instruction button 73 labeled "ARCHITECTURE DOCUMENT REGISTRATION". A dictionary concerning 20 medical practice is set for the instruction button 74 labeled "MEDICAL DOCUMENT REGISTRATION".

FIG. 9 illustrates an example of a display screen for preparing the instruction button 71 labeled "CLIENT REGISTRATION". In this example, similar items to those 25 in the screen of FIG. 5 are set. Further, in the case of FIG. 9, "WITH OCR PROCESSING" is designated as the panel name, "CLIENT REGISTRATION" as the button name,

5 "CLIENT LIST" as the name of a folder as the destination of registration, and "DICTIONARIES CONCERNING NAMES AND ADDRESSES" as the dictionaries used for character recognition. The contents set for each instruction button are reflected in the contents in the management table 15a of the management section 15 as shown in FIG. 8.

10 FIG. 10 illustrates an example of a display screen of the display 2a of the data retrieving personal computer 2, used when a document registered in the document management server 3 is retrieved using the computer 2. Using the display 2a of the personal computer 2, the user can retrieve a document, registered in the document management server 3, from 15 the image database 32 having a folder tree structure, and also from the full-text-search database 31 that stores text data corresponding to the document.

20 In the retrieval using the folder tree structure, the folders registered in the image database 32 are displayed in a tree structure on the display screen of the personal computer 2, thereby enabling the user to select a target folder from the displayed folders.

25 Further, in the full text (natural language) retrieval, the user can retrieve, using the full-text-search database 31, the entire text data corresponding to images on a target document simply by inputting a voluntarily selected word (a character, a word, a

0007600-120709960

sentence, etc.).

5 In other words, when the user has input, to the data retrieving personal computer 2, a word or a sentence as a keyword for retrieving a target document, the personal computer 2 retrieves the keyword from the entire text data registered in the full-text-search database 31 and resulting from OCR processing, thereby displaying, as a retrieval result, a list of document images that contain the keyword.

10 At this time, those of the document images, which contain lots of keywords, may be determined to be a retrieval result, or may be arranged in order in accordance with the number of keywords contained therein.

15 When document images have been obtained by the retrieval using the folder tree structure or by the retrieval using the full-text-search function, the data retrieving personal computer 2 displays a list of document images as a retrieval result, as is shown in FIG. 10.

20 Thus, images on a desired document can be retrieved on the basis of the name of a folder or a management structure, in which the document images is registered, and can be retrieved using a keyword contained therein.

25 FIG. 11 is a flowchart useful in explaining the process executed in the second embodiment.

008T954074-0091800

First, the user designates the name of a panel (display screen) to which a to-be-used instruction button belongs, by touching the touch panel 14a of the display 14. Then, the instruction buttons belonging to the designated panel are displayed on the display 14. The user selects the to-be-used instruction button from the screen (step ST11). Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST12).

The control section 11 sets a configuration for inputting images on the basis of the contents read from the management table 15a (step ST13). The control section 11 further sets a dictionary for the OCR processing configuration (mode) and OCR processing itself on the basis of the contents read from the management table 15a (step ST14).

Then, the user pushes the instruction button for inputting an instruction to start data reading, whereby the control section 11 controls the image input section 12 so as to start input of images (step ST15).

Upon inputting the images, the control section 11 controls the OCR processing section 13 so as to execute OCR processing on the input images under the configuration set for OCR processing, using the dictionary set at the step ST14 (step ST16).

After OCR processing on the read images is

008764074-001200

finished, the control section 11 registers the images in a folder contained in the image database 32 and designated by the management table 15a in accordance with the instruction button (step ST17). Subsequently, 5 the control section 11 registers, in the full-text-search database 31, text data (a text document) resulting from OCR processing, together with information indicating the storing place (folder) of the images (step ST18).

10 After registering the OCR processing result and the images, the control section 11 writes the processing result into an operation log table 15b described later (step ST19), and finishes the process related to the pushed instruction button.

15 As described above, the conditions for OCR processing executed on document images, and a folder as the destination of registration of the document images are set in relation to the pushed instruction button, whereby an appropriate one of the instruction buttons 20 is used so that OCR processing will be executed under OCR conditions corresponding to the type of a to-be-processed document.

25 As a result, various conditions for OCR processing corresponding to various types of to-be-processed documents can be set in relation to the instruction buttons, and the accuracy of OCR processing can be enhanced when an appropriate instruction button is used.

Further, the OCR conditions are set in accordance with a language such as Japanese, English, etc., a character pitch such as a standard pitch, a fixed pitch, etc., which are used for OCR processing, or in 5 accordance with the type of a to-be-registered document such as an address list, a medical practice document, a technical document, etc.

Accordingly, only one instruction button enables simultaneous registration of document images and the 10 result of OCR processing executed on the document images, and also enables realization of highly accurate OCR processing according to the type of a to-be-registered document.

In addition, the dictionary used for OCR 15 processing, included in the OCR processing conditions, is set in accordance with the type of a to-be-registered document. This enables OCR processing of high character recognition accuracy according to the type of the to-be-registered document.

20 A third embodiment of the invention will be described.

In the third embodiment, a device is supposed, which is used as a network scanner shown in FIG. 2 and has two functions of image printing and image input as 25 in the digital copy machine 1. This embodiment is characterized in that the user transmits, via a local area network (LAN) to the digital copy machine 1, a

page to be subjected to OCR processing, thereby attaching the transmitted page as a to-be-scanned document image to images read by the digital copy machine 1.

5 The digital copy machine 1 has a function called "private printing". This function is for printing an image, transmitted from an external device to the copy machine 1, when the user has instructed the machine to print the image.

10 Specifically, when the user has transmitted, from an external device such as a personal computer to the digital copy machine 1, image data in the form of a character code, together with an instruction to execute private printing, the digital copy machine 1 converts, 15 into image data, the character code transmitted from the external device, thereby temporarily storing it in the memory 16. After that, if the user instructs the digital machine 1 to print the image data, using the operation panel of the digital machine 1, the image data stored in the memory 16 is printed by the printer 20 section 17.

25 In the third embodiment, the private printing function is used to attach an image, transmitted from an external device, to images read by the digital copy machine 1 as the network scanner 1, thereby forming a document. After that, the obtained document images and text data obtained by subjecting the document to OCR

processing are simultaneously registered.

FIG. 12 is a flowchart useful in explaining the flow of processing executed in the third embodiment. Referring to this flowchart, a description will be 5 given of the operation of transmitting a page as the front cover of a document to the digital copy machine 1 using the private printing function, and causing the copy machine 1 to read document images as the second page, et seq.

10 First, the user prepares an instruction button (panel button) used for executing OCR processing and registering resultant document images (step ST21). The user also creates a page to be used as the front cover of the document images, using, for example, their own 15 personal computer (data retrieving personal computer) 2 as an external device connected to the LAN 4. This page is a page on which, for example, a sentence input by the user is printed, and data thereon is transmitted to the outside in the form of a character code.

20 After creating the page as the front cover, the user issues an instruction to execute private printing of the page, using the data retrieving personal computer 2 (step ST22). Subsequently, the personal computer 2 transmits, to the digital copy machine 1, both an instruction to execute private printing, and 25 the page as the target of private printing converted in the form of a character code.

003760-T/049960

When the digital copy machine 1 has received the page as the target of private printing, the control section 11 converts the received character code of the page into image data and stores it in the memory 16 (step ST23).

After that, the user directly sets, at the image input section 12 of the digital copy machine 1, to-be-scanned and registered document pages after the front page (step ST24). Before scanning the pages, the user 10 selects the instruction button prepared at the step ST21 (step ST25).

Then, the control section 11 displays, on the display 14, guidance "AUTOMATIC ATTACHMENT FOR PRIVATE PRINTING" and the selected instruction button. When 15 the user has selected "AUTOMATIC ATTACHMENT FOR PRIVATE PRINTING" (step ST26), the control section 11 displays a list of images that can be subjected to private printing. The user selects one of the listed images, which they would like to make the front page, by 20 touching the touch panel 14a (step ST27). After the user pushes the read start button (step ST28), the control section 11 reads the set document pages.

After reading the set document pages, the image selected at the step ST27 from the document images that 25 can be subjected to private printing is electronically added as the front cover page of the document images (step ST29). The control section 11 controls the OCR

0008160-T20409360

processing section 13 so as to execute OCR processing on the document images within the page range designated in advance when the instruction button is prepared (step ST30).

5 After finishing OCR processing on the document images, the control section 11 registers the document images in a folder contained in the image database 32 and designated by the instruction button (step ST31). Further, the control section 11 registers, in the full-
10 text-search database 31, both a text document resulting from OCR processing, and information concerning the image storage place (folder) (step S32). After finishing the registration of the document images and the OCR processing result, the control section 11
15 writes the processing result as an operation log into the management section 15 (step ST33), thereby finishing processing concerning the instruction button.

In the third embodiment, a character code, which indicates data on a page to be used as the front cover
20 of a document and is transmitted from an external device using the private printing function, is converted into image data, and is attached as the first page to the other document images and subjected to OCR processing. However, this operation may be modified
25 such that page data constructed by the character code transmitted for printing from the external device is directly registered in the full-text-search database 31,

003T60-17074-001860

without being converted into image data.

On the other hand, when registering, in the image database 32, the character code transmitted for printing from the external device, the code is
5 converted into image data.

As described above, in the third embodiment, an instruction to print only the front cover of a document is input from an external device, using the private printing mode, thereby electronically attaching an image, instructed to print as the front cover of the document, to to-be-registered document images, and scanning the other pages of the document. Those of the thus-obtained document images, which are included within the page range set in accordance with the
10 instruction button, are subjected to OCR processing, whereby the document images are registered in a folder, and text data resulting from OCR processing is
15 registered in the full-text-search database.

Thus, a page created by, for example, an external device can be attached to document images actually read by the scanner, and registered as a document image. This can omit the operation of printing an image of a to-be-attached page on, for example, a sheet of paper, and then reading the printed image. As a result, paper
25 and time can be saved.

A fourth embodiment of the invention will be described.

0031600-T2049360

The fourth embodiment is characterized in that information concerning the instruction button used to scan a document is attached as text data to an OCR processing result and registered.

5 FIG. 13 is a flowchart useful in explaining the flow of processing executed in the fourth embodiment.

First, the user designates the name of a panel to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel 10 designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons on the display (step ST41). Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button 15 from the management table 15a of the management section 15 (step ST42).

The control section 11 then sets a configuration for inputting images on the basis of data read from the management table 15a (step ST43). After the user 20 touches the read start button, the control section 11 starts inputting of images through the image input section 12 (step ST44).

Further, the control section 11 sets a configuration (mode) for OCR processing on the basis of 25 the set contents of the instruction button, which concern OCR processing and are read from the management table 15a of the management section 15 (step ST45).

00010800-104071-004960

Upon inputting images, the control section 11 controls the OCR processing section 13 so as to execute OCR processing on the input images under the set OCR processing configuration (step ST46).

5 After finishing OCR processing on the input images, the control section 11 registers them in a folder contained in the image database 32 and designated by the selected instruction button (step ST47).

10 The control section 11 reads, from the management table 15a of the management section 15, the name, the attribute, etc. of the instruction button (step S48). The control section 11 adds the read button attribute to a text document resulting from OCR processing (step S49).

15 Subsequently, the control section 11 registers, in the full-text-search database 31, the text document resulting from OCR processing, together with information indicating the image storing place (folder) (step ST50). After registering the OCR processing 20 result and the images, the control section 11 writes the processing result as an operation log into the management section 15 (step ST51), and finishes the process related to the selected instruction button.

25 As described above, in the fourth embodiment, the set contents of the selected instruction button displayed on the display 14 of the network scanner 1, such as the name of the instruction button, the name of

the display screen displaying the instruction button, or the name of the user, are registered in the full-text-search database together with a text as a character recognition result.

5 Thus, not only text data resulting from OCR processing executed on a to-be-registered document, but also various data items and/or set values relating to the document are registered in the full-text-search database. This increases information that can be used 10 as a clue to a to-be-retrieved document, and hence enhances the efficiency of full text searching.

15 A fifth embodiment will be described.

15 The fifth embodiment is characterized in that all recognition candidates used during OCR processing are registered in the full-text-search database 31, instead of the final OCR processing result. This enhances the probability of retrieval of a desired document and is therefore advantageous where there is a recognition error during OCR processing. Accordingly, the 20 efficiency of full text searching is further enhanced.

25 In the fifth embodiment, the OCR processing section 13 is supposed to have a function of executing OCR processing, and a function of executing sentence analysis on the recognition result of OCR processing. In the sentence analysis, candidates other than the recognition result of OCR processing are selected by comparing, for example, each word or sentence with that

008T61071-004000

recited in a dictionary (not shown). For example, when the dictionary contains a more probable word than that included in the OCR processing recognition result, it is selected as a candidate resulting from the sentence analysis.

FIG. 14 is a flowchart useful in explaining the flow of processing executed in the fifth embodiment.

First, the user designates the name of a panel to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons on the display (step ST61). Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST62).

The control section 11 then sets a configuration for inputting images on the basis of data read from the management table 15a (step ST63). After the user touches the read start button, the control section 11 starts input of images through the image input section 12 (step ST64).

Further, the control section 11 sets a configuration (mode) for OCR processing on the basis of the set contents of the instruction button, which concern OCR processing and are read from the management

table 15a of the management section 15 (step ST65).

Upon inputting images, the control section 11 controls the OCR processing section 13 so as to execute OCR processing on the input images under the set OCR processing configuration (step ST66).

5 After finishing OCR processing on the input images, the control section 11 registers them in a folder contained in the image database 32 and designated by the selected instruction button (step ST67).

10 The control section 11 controls the OCR processing section 13 so as to further execute, at the step S66, sentence analysis on the OCR processing result (step ST68). After finishing the sentence analysis, the control section 11 adds a plurality of recognition candidates obtained by the sentence analysis, a text document resulting from OCR processing (step S69).

15 Subsequently, the control section 11 registers, in the full-text-search database 31, the text document resulting from OCR processing, together with information indicating the image storing place (folder) (step ST70). After registering the OCR processing result and the images, the control section 11 writes the processing result as an operation log into the management section 15 (step ST71), and finishes the process related to the selected instruction button.

25 As described above, in the fifth embodiment, sentence analysis is executed on an OCR processing

result, then a character string including conversion candidates (recognition candidates) is added to a text document as an image recognition result, and the resultant text document is registered in the full-text-
5 search database.

Thus, the efficiency of full text searching is enhanced by executing fuzzy registration in the full-text-search database. In other words, full text searching is executed even on a plurality of 10 recognition candidates, thereby enhancing the efficiency of data retrieval.

A sixth embodiment will be described.

The sixth embodiment is characterized in that when reading a plurality of documents at one time, information indicating the end of each document (separator information, a page separator) is detected, and then an area or a character used as a page separator indicating the end of each document is erased. The page separator is used to enable automatic recognition of each document end, and is not necessary for full text search of each document. Unnecessary information can be removed from document images by erasing the page separator therefrom, which enhances the efficiency of full text searching.

25 In the sixth embodiment, the OCR processing section 13 is supposed to have a function of recognizing the page separator. The process of

recognizing the page separator will be referred to as "OMR processing".

5 The page separator is formed of a predetermined symbol or character, or a predetermined character string recited in a predetermined area. Alternatively, a separator sheet containing predetermined contents may be used so that the entire sheet is recognized as a page separator.

10 When, for example, recognizing a page separator formed of a symbol specified in a predetermined area of a read image, the OCR processing section 13 recognizes the page separator if the symbol indicating the separator exists in the predetermined area. Further, when recognizing a page separator formed of a predetermined character string, the OCR processing section 13 recognizes the page separator if the character string indicating the separator is recognized as a result of OCR processing executed on a read image.

15 FIG. 15 is a flowchart useful in explaining the flow of processing executed in the sixth embodiment.

20 First, the user designates the name of a panel to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons on the display (step ST81). Subsequently, the control section 11 reads attribute

09654071.0091800

data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST82).

5 The control section 11 then sets a configuration for inputting images on the basis of data read from the management table 15a. After the configuration for inputting images is set and the user touches the read start button, the control section 11 starts input of images through the image input section 12 (step ST83).

10 After starting the input of the images, the control section 11 sets a configuration (mode) for processing (OMR processing) for recognizing a page separator using the OCR processing section 13 (step ST84). After setting the configuration for OMR 15 processing, the control section 11 controls the OCR processing section 13 so as to execute OMR processing on the images input through the image input section 12 (step ST85).

20 Then, the control section 11 sets a configuration for OCR processing on the basis of the set contents of the instruction button concerning OCR processing and read from the management table 15a of the management section 15 (step ST86). The control section 11 controls the OCR processing section 13 so as to execute 25 OCR processing on the input images under the set OCR processing configuration (step ST87).

After finishing OCR processing on the input images,

0004074-004800

the control section 11 registers them in a folder contained in the image database 32 and designated by the selected instruction button (step ST88).

5 Where the page separator is formed of a figure or a symbol specified in a predetermined area, the area recognized as the page separator by OMR processing is painted with a background color (i.e. the area is erased). Further, where the page separator is formed of a predetermined character string (a key character string), the key character string recognized as the page separator by OMR processing is erased (step ST89).

10 Subsequently, the control section 11 registers, in the full-text-search database 31, the text document resulting from OCR processing, together with 15 information indicating the image storing place (folder) (step ST90). After registering the OCR processing result and the images, the control section 11 writes the processing result as an operation log into the management section 15 (step ST91), and finishes the 20 process related to the selected instruction button.

As described above, in the sixth embodiment, an instruction button is set for inputting an instruction to divide, into two steps as follows, OCR processing executed after one scan operation, and then to execute 25 the two steps simultaneously.

Step 1: To determine a document range (page range) from scanned images and execute OMR processing for

00654071-001800

automatic division (separator detection and document page division).

Step 2: To erase separator information for OMR processing from each document image resulting from OMR processing, and then to extract a search key (including a full text search key) and execute OCR processing for registration.

A key character string used at the step 1 for recognizing the first page of each document, i.e.

information indicating the page separator, is erased at the step 2, thereby registering the OCR processing result in the full-text-search database.

Since information irrelevant to the contents of each document is erased and hence not registered in a database, the efficiency of full text searching is enhanced.

A seventh embodiment will be described.

The seventh embodiment is characterized in that the confirmation printing function for a scanned image is applied to confirmation of an OCR processing result such that the OCR processing result is printed as one page to be added to scanned document images. In the seventh embodiment, a device having a printer section, as shown in FIG. 2, is supposed to be used.

FIG. 16 shows an example of a confirmation printing result obtained by printing a processing result by a printer section 16 for confirmation.

As shown in FIG. 16, in a confirmation printing result of a processing result, a scanned document image is printed on a left-hand portion of a printing medium, and a text obtained as a character recognition result of the left-hand portion is printed on a right-hand portion of the printing medium. Thus, a network scanner or a digital copy machine, which does not have a function of displaying an image immediately after the image is scanned, can confirm, by printing, the scanned image and its OCR processing result. This is very advantageous since it can be determined, for example, whether or not the image must be input again, immediately after it is scanned.

FIG. 17 is a flowchart useful in explaining the
15 flow of processing executed in the seventh embodiment.

First, the user designates the name of a panel to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons on the display, which designates confirmation printing (step ST101). Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST102).

The control section 11 then sets a configuration

for inputting images on the basis of data read from the management table 15a (step ST103). After the user touches the read start button, the control section 11 starts input of images through the image input section 12 (step ST104).

Further, the control section 11 sets a configuration (mode) for OCR processing on the basis of the set contents of the selected instruction button, which concern OCR processing and are read from the management table 15a of the management section 15 (step ST105). Upon inputting images, the control section 11 executes OCR processing on the input images under the set OCR processing configuration (step ST106).

After finishing OCR processing on the input images, the control section 11 prints, on a paper sheet, a to-be-confirmed image and a text resulting from OCR processing, using a printer section 17 (step ST107).

Then, the control section 11 registers the images in a folder contained in the image database 32 and designated by the selected instruction button (step ST108). Subsequently, the control section 11 registers, in the full-text-search database 31, the text document resulting from OCR processing, together with information indicating the image storing place (folder) (step ST109).

After registering the OCR processing result and the images, the control section 11 writes the

processing result as an operation log into the management section 15 (step ST110), and finishes the process related to the selected instruction button.

5 As described above, the device of this embodiment has a function of executing confirmation printing of a scanned image, and prints a document image and a text resulting from OCR processing on the image when executing confirmation printing.

10 This function enables a network scanner or a digital copy machine, which does not have a function of displaying an image immediately after scanning it, to immediately confirm the scanned image and its OCR processing result by printing. As a result, the necessary, for example, of re-input of the scanned 15 image can be determined instantaneously.

An eighth embodiment will be described.

20 In the eighth embodiment, the network scanner 1 is supposed to have an allowable maximum value section 116 for managing a maximum scanning data amount for each document, and a size determining section 117 for determining whether or not a scanned document image exceeds a predetermined allowable value, as is shown in FIG. 18.

25 A digital copy machine as the network scanner 1 employed in the eighth embodiment can be used freely by the user to scan a document and transfer electronic data indicating the document to another device on the

0004074095960

network. The user may use the machine to scan a large amount of image data and transfer a large amount of data to the network, thereby adversely influencing the entire network. To prevent this, it is very useful to 5 employ a function of in advance setting a maximum scan data amount for each document.

However, when, in this case, the data amount exceeds the maximum allowable value, it is necessary to, for example, re-scan a document. In light of this, a 10 more efficient operation system is required.

To meet the requirement, the eighth embodiment is characterized in that when image data amount on each scanned document exceeds the maximum allowable value, only text data resulting from OCR processing executed 15 on the image data is registered, and a message "the image data itself was not registered since the image data amount exceeded the maximum allowable value" is stored as an operation log in the management section 15.

As shown in FIG. 18, in this network system, the 20 allowable maximum value section 116 manages the maximum data amount for each document to be scanned by the network scanner 1, and the size determining section 117 determines whether or not the data size of each scanned document exceeds the maximum data amount managed by the 25 maximum value section 116.

Moreover, the network scanner 1 stores, in the management section 15, an operation log indicating a

processing result each time processing corresponding to one instruction terminates. The operation log includes a date item, an event level item and an operation contents item as shown in FIG. 20.

5 In the data item, a date at which certain process was executed is stored. In the event level item, "NORMAL TERMINATION" is written when the certain process terminated normally, and "WARNING", for example, which indicates a certain error level, is written when 10 the certain process terminated erroneously.

In the operation contents item, the contents of the executed process are stored. When the process 15 terminated normally, a message, for example, "a document was registered in the BUSINESS DAILY REPORT (YAMADA)", is stored, which indicates the contents of the process. On the other hand, when the process terminated erroneously, a message, for example, "only the OCR processing result was registered in the BUSINESS DAILY REPORT (YAMADA) since the input image 20 size exceeded an allowable size (2MB)" is stored, which indicates the contents of an error and the contents of a process executed for the error.

Thus, when the data size of each document has exceeded the maximum data value managed by the maximum 25 value section 116, the control section 11 stores the contents of the error as an operation log in the management section 15, as is shown in FIG. 20. This

0013800 - 00496074 - 004960

operation log enables the user to confirm the contents of the process later.

FIG. 15 is a flowchart useful in explaining the flow of processing executed in the eighth embodiment.

5 First, the user designates the name of a panel to which a to-be-used instruction button belongs. Then, the instruction buttons that belong to the panel designated by the user through the touch panel 14a of the display 14 are displayed. The user selects one of the instruction buttons on the display (step ST121).
10 Subsequently, the control section 11 reads attribute data corresponding to the selected instruction button from the management table 15a of the management section 15 (step ST122).

15 The control section 11 then sets a configuration for inputting images on the basis of data read from the management table 15a (step ST123). After the user touches the read start button, the control section 11 starts inputting of images through the image input section 12 (step ST124).

20 Further, the control section 11 sets a configuration (mode) for OCR processing on the basis of the set contents of the instruction button, which concern OCR processing and are read from the management table 15a of the management section 15 (step ST125). Upon inputting images, the control section 11 controls the OCR processing section 13 so as to execute OCR

processing on the input images under the set OCR processing configuration (step ST126).

The control section 11 controls the size determining section 117 so as to determine whether or 5 not the data size of each document exceeds the maximum allowable value (step ST127). If the control section 11 determines that the data size exceeds the maximum allowable value, it registers, in a folder designated by the selected instruction button, a message "the 10 input document data size has exceeded the limit value" and the OCR processing result (step ST128). If, on the other hand, the control section 11 determines that the data size does not exceed the limit value, it registers the document images in a folder contained in the image 15 database 32 and designated by the selected instruction button (step ST129).

Subsequently, the control section 11 registers, in the full-text-search database 31, a text document resulting from OCR processing, together with 20 information indicating the image storing place (folder) (step ST130). After registering the OCR processing result and the images, the control section 11 writes the processing result as an operation log into the management section 15 (step ST131), and finishes the 25 process related to the selected instruction button.

As described above, where the data size of scanned images exceeds a predetermined allowable value, the

images are not registered and only a text as a
recognition result is registered. Further, the
contents of this process are stored as an operation log.

5 As a result, when the data size of the images is
too big and hence they cannot be registered, only text
data is registered as required minimum data, which
makes re-inputting of the images unnecessary.

10 Thus, the present invention can more facilitate
the operation of the system by the user and can enhance
the performance of OCR processing, the system being
configured to use a network scanner that includes a
scanner function incorporated in a digital copy machine,
and to manage document images by registering them in a
document managing server, together with the result of
15 OCR processing executed on them.

20 Further, in this invention, scanned document
images are subjected to OCR processing and registered
in a folder which is contained in an image management
database for managing images using a folder structure,
and which is designated by the user. At the same time,
the OCR processing result of the images is registered
in a full-text-search database. The images can be
retrieved from each of the image management database
and the full-text-search database.

25 Furthermore, in this invention, the user prepares
instruction buttons, before inputting document images,
for designating a language, a character pitch, a field

to which a to-be-scanned document belongs (address data, medical practice information, etc.) in order to enhance the effects of OCR processing executed on the images (such as the rate of processing, the rate of
5 recognition of characters by automatic selection of a special dictionary prepared for the recognition). These instruction buttons are displayed on a display and selectively used before the images are input.

Also, in this invention, data related to OCR processing and the registration destination (a server, a folder, etc.) of each document can be simultaneously designated by a single panel button. Accordingly, the user can set all processes necessary for a to-be-scanned document simply by selecting one of buttons on
10 15 the display when using the scanner.

Although, in the system structure shown in FIG. 1, 2 or 8, the network scanner 1 is physically separated from the document management server 3 but interactively connected thereto by a certain network, the function
20 of the server 3 may be incorporated in the network scanner 1.

As described above in detail, the invention can provide an information input device for the user easy to use and capable of efficiently retrieving a registered document image with maximum character
25 recognition accuracy.

Additional advantages and modifications will

09564074.0001800

readily occur to those skilled in the art. Therefore,
the invention in its broader aspects is not limited to
the specific details and representative embodiments
shown and described herein. Accordingly, various
5 modifications may be made without departing from the
spirit or scope of the general inventive concept as
defined by the appended claims and their equivalents.

09654071.091800

WHAT IS CLAIMED IS:

1. An information input device comprising:
 - an image reading section for reading images on each of documents;
 - 5 a character recognition section for subjecting, to character recognition processing, the images read by the image reading section;
 - a display section for displaying various types of instruction buttons;
 - 10 a management section for managing set contents corresponding to each of the instruction buttons displayed on the display section, the set contents including a destination of registration of the images read by the image reading section, and contents of processing executed on the images by the character recognition section; and
 - 15 a control section for executing control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to said one of the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling the character recognition section so as to execute character recognition processing on the read images,
 - 20 and simultaneously registering the read images and a result of character recognition processing executed on the read images.
 - 25

2. The information input device according to
claim 1, wherein:

the management section manages the set contents
corresponding to said one of the instruction buttons,
5 the set contents including the destination of
registration of the images read by the image reading
section, the contents of processing executed on the
images by the character recognition section, and a
range of processing executed by the character
recognition section; and

10 the control section executes control, when one of
the instruction buttons has been designated, on the
basis of the set contents corresponding to said one of
the instruction buttons and managed by the management
15 section, the control section controlling the image
reading section so as to read the images, controlling
the character recognition section so as to execute
character recognition processing on those of the read
images which are contained within the range of
20 processing, and simultaneously registering the read
images and a result of character recognition processing
executed on the read images contained within the range
of processing.

25 3. The information input device according to
claim 1, wherein:

the management section manages the set contents
corresponding to said one of the instruction buttons,

00010000-1200-9960

the set contents including the destination of
registration of the images read by the image reading
section, the contents of processing executed on the
read images by the character recognition section, and
5 processing conditions corresponding to types of the
documents; and

the control section executes control, when one of
the instruction buttons has been designated, on the
basis of the set contents corresponding to said one of
10 the instruction buttons and managed by the management
section, the control section controlling the image
reading section so as to read the images, controlling
the character recognition section so as to execute
character recognition processing on the read images
15 under the processing conditions, and simultaneously
registering the read images and a result of character
recognition processing executed on the read images.

4. The information input device according to
claim 3, wherein the processing conditions
20 corresponding to types of the documents include
designation of a dictionary to be used for character
recognition processing.

5. The information input device according to
claim 1, further comprising a memory for accumulating
25 an image transmitted from an external device,
and wherein
the character recognition section subjects, to

008700-12049960

character recognition processing, the images read by the image reading section or the image accumulated in the memory; and

5 the control section executes control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to said one of the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling 10 the character recognition section so as to execute character recognition processing on images obtained by attaching the image accumulated in the memory to the read images, and simultaneously registering the images obtained by attaching the image accumulated in the 15 memory to the read images, and a result of character recognition processing.

6. The information input device according to claim 1, wherein the control section executes control, when one of the instruction buttons has been designated, 20 on the basis of the set contents corresponding to said one of the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling the character recognition section so as to execute character recognition processing on the read 25 images, registering the read images, and simultaneously registering a result of character recognition

09054071-091300

processing executed on the read images, together with the set contents corresponding to said one of the instruction buttons.

7. The information input device according to
5 claim 1, wherein

the character recognition section subjects, to character recognition processing, the images read by the image reading section, and also subjects a result of character recognition processing to sentence 10 analysis processing for determining other recognition candidates; and

the control section executes control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to said one of the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling the character recognition section so as to execute character recognition processing on the read images, 15 subjecting a result of character recognition processing to sentence analysis processing, registering the read images, and simultaneously registering the result of character recognition processing together with 20 recognition candidates obtained by the sentence analysis processing.

8. The information input device according to
claim 1, wherein

00040800-40004000

the character recognition section has a function of subjecting, to character recognition processing, the images read by the image reading section, and a function of detecting, from the images read by the 5 image reading section, separator information indicating an end of said each of the documents; and

the control section executes control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to said one of 10 the instruction buttons and managed by the management section, the control section controlling the image reading section so as to read the images, controlling the character recognition section so as to execute character recognition processing on images on each 15 document having an end thereof detected when the separator information is detected, registering the images on said each document after erasing the separator information from the images read by the image reading section, and simultaneously registering a 20 result of character recognition processing executed on the read images on said each document.

9. The information input device according to claim 1, further comprising a printing section for printing the images registered by the control section, 25 and data indicating the result of character recognition processing executed on the read images.

10. The information input device according to

claim 1, wherein control section executes control, when one of the instruction buttons has been designated, on the basis of the set contents corresponding to said one of the instruction buttons and managed by the
5 management section, the control section controlling the image reading section so as to read the images and determine whether or not the read images have a data size greater than an allowable limit value, controlling the character recognition section so as to execute
10 character recognition processing on the read images, registering only a result of character recognition processing executed on the read images, without registering the read images in a destination of registration corresponding to said one of the
15 instruction buttons if the read images have a data size greater than the allowable limit value, the control section registering the result of character recognition processing executed on the read images, and simultaneously registering the read images in the
20 destination of registration corresponding to said one of the instruction buttons if the read images does not have a data size greater than the allowable limit value.

ABSTRACT OF THE DISCLOSURE

The present invention employs an instruction button for inputting an instruction to simultaneously executing registration, in a full-text-search database, 5 of a document scanned by one scanning operation and subjected to OCR processing, and registration of the document in a designated folder contained in a database of a folder tree structure. This single instruction button enables the user to simultaneously register read 10 images in a folder, and text data resulting from OCR processing executed on the read images.

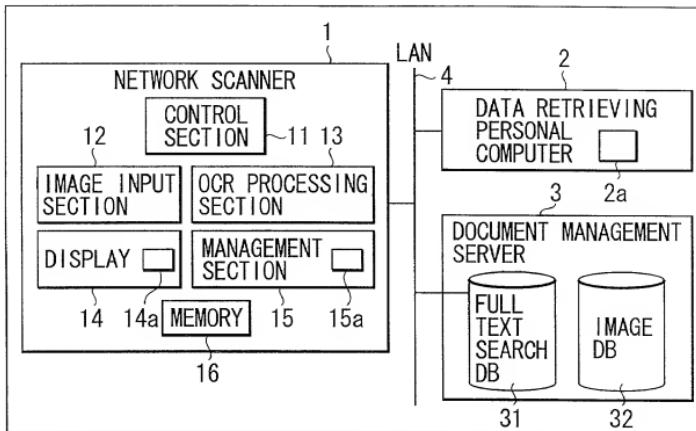


FIG. 1

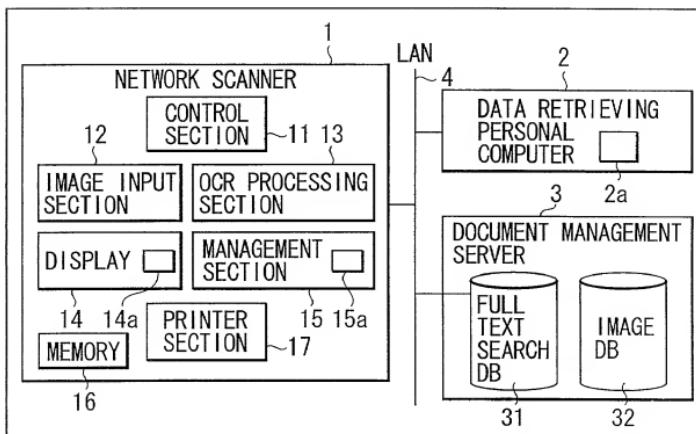


FIG. 2

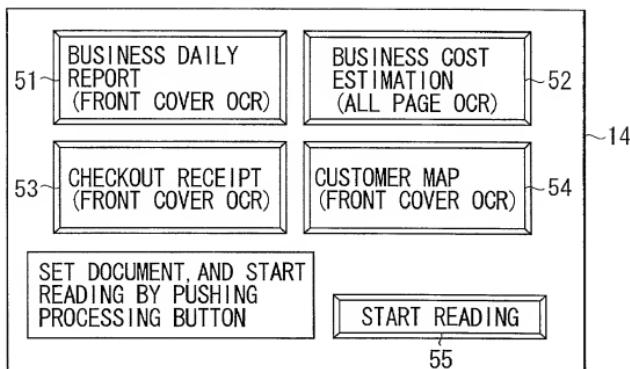


FIG. 3

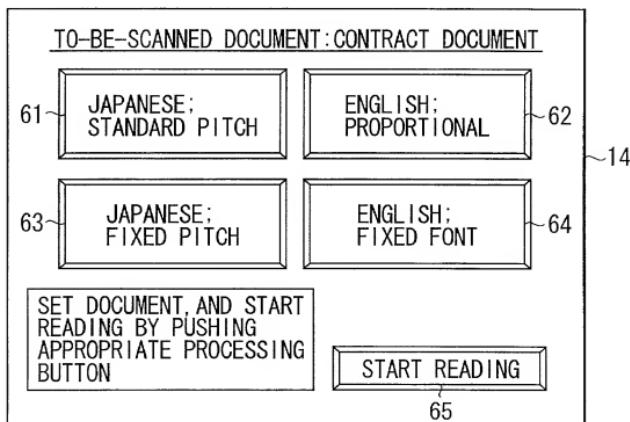


FIG. 4

EXAMPLE OF SCREEN FOR PREPARING INPUT PANEL
BUTTON FOR BUSINESS DAILY REPORTPANEL BUTTON PREPARING SCREEN

PANEL NAME:	<u>YAMADA'S EXCLUSIVE USE</u>
BUTTON NAME:	<u>BUSINESS DAILY REPORT</u>
DESTINATION FOLDER NAME:	<u>BUSINESS DAILY REPORT</u>
OCR PROCESSING:	<u>YES</u>
DICTIONARY TO BE USED FOR CHARACTER RECOGNITION:	<u>GENERAL, MEDICAL PRACTICE</u>
CONFIRMATION PRINTING:	<u>NO</u>
DOCUMENT SEPARATOR RECOGNITION:	<u>YES</u>
DOCUMENT AUTOMATIC DIVISION:	<u>NO</u>
OCR SETTING...LANGUAGE:	<u>JAPANESE</u>
OCR SETTING...CHARACTER PITCH:	<u>STANDARD</u>
OCR SETTING...PROCESSING RANGE:	<u>ONE PAGE</u>

A rectangular button labeled "PREPARE" in a sans-serif font, enclosed in a thin black border.A rectangular button labeled "CANCEL" in a sans-serif font, enclosed in a thin black border.

FIG. 5

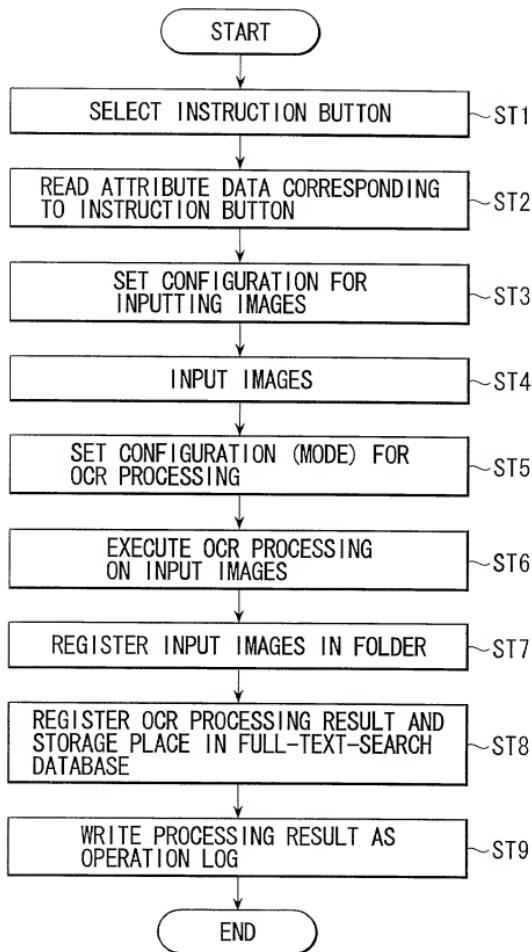


FIG. 6

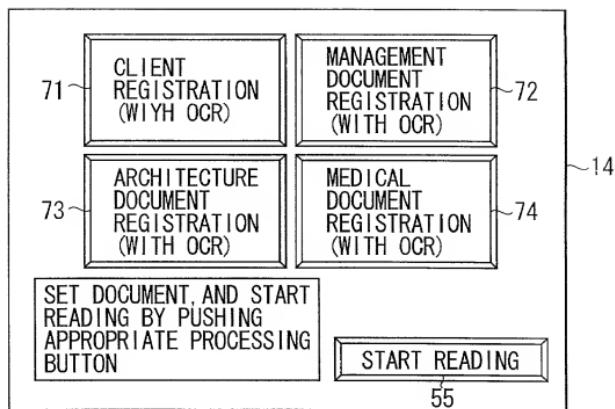


FIG. 7

BUTTON NUMBER	BUTTON NAME	CONFIRMATION PRINTING	SEPARATOR RECOGNITION	DOCUMENT DIVISION	DICTIONARY FOR USE	OCR LANGUAGE	OCR PITCH	OCR PROCESSING RANGE
1	CLIENT REGISTRATION	YES	NO	YES	NAME ADDRESS	JAPANESE	FIXED	ALL PAGES
2	MANAGEMENT DOCUMENT REGISTRATION	YES	YES	YES	MANAGEMENT ECONOMY	JAPANESE	STANDARD	ALL PAGES
3	ARCHITECTURE DOCUMENT REGISTRATION	YES	NO	YES	ARCHITECTURE	ENGLISH	STANDARD	ONLY FIRST PAGE
3	MEDICAL DOCUMENT REGISTRATION	YES	NO	YES	MEDICAL PRACTICE	ENGLISH	STANDARD	ALL PAGES

FIG. 8

PANEL BUTTON PREPARING SCREEN

PANEL NAME: WITH OCR PROCESSING
BUTTON NAME: CLIENT REGISTRATION
DESTINATION FOLDER NAME: CLIENT LIST
OCR PROCESSING: YES
DICTIONARY TO BE USED
FOR CHARACTER RECOGNITION: NAME ADDRESS
CONFIRMATION PRINTING: YES
DOCUMENT SEPARATOR RECOGNITION: NO
DOCUMENT AUTOMATIC DIVISION: DIVIDE DOCUMENT IN UNTS
OF 3 PAGES
OCR SETTING...LANGUAGE: JAPANESE
OCR SETTING...CHARACTER PITCH: FIXED
OCR SETTING...PROCESSING RANGE: ALL PAGES

PREPARE

CANCEL

14

FIG. 9

SCREEN FOR RETRIEVING DOCUMENT IMAGE

FOLDER TREE SEARCH:

BUSINESS DAILY REPORT (YAMADA)
BUSINESS DAILY REPORT (KATOH)

NATURAL LANGUAGE (FULL TEXT) SEARCH:

LIST OF DOCUMENT
IMAGES AS SEARCH RESULT:



2a

FIG. 10

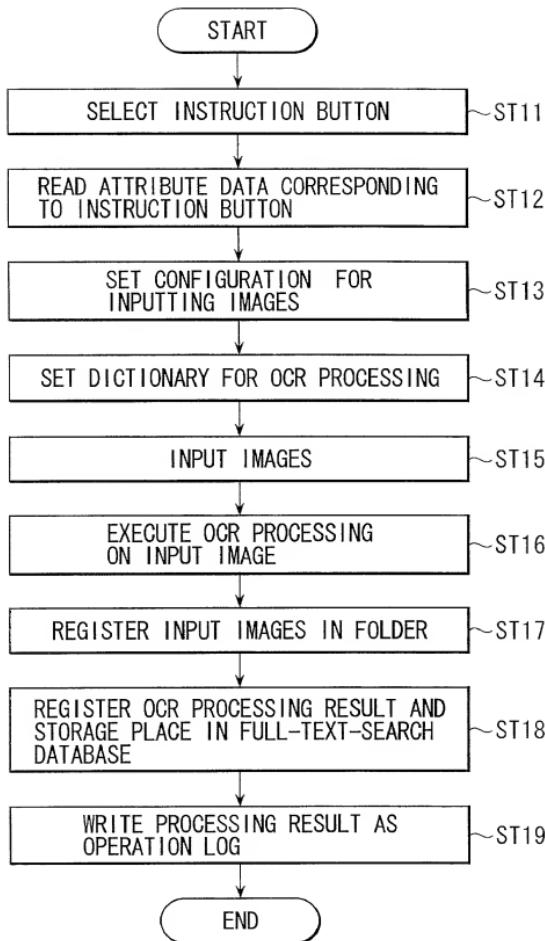


FIG. 11

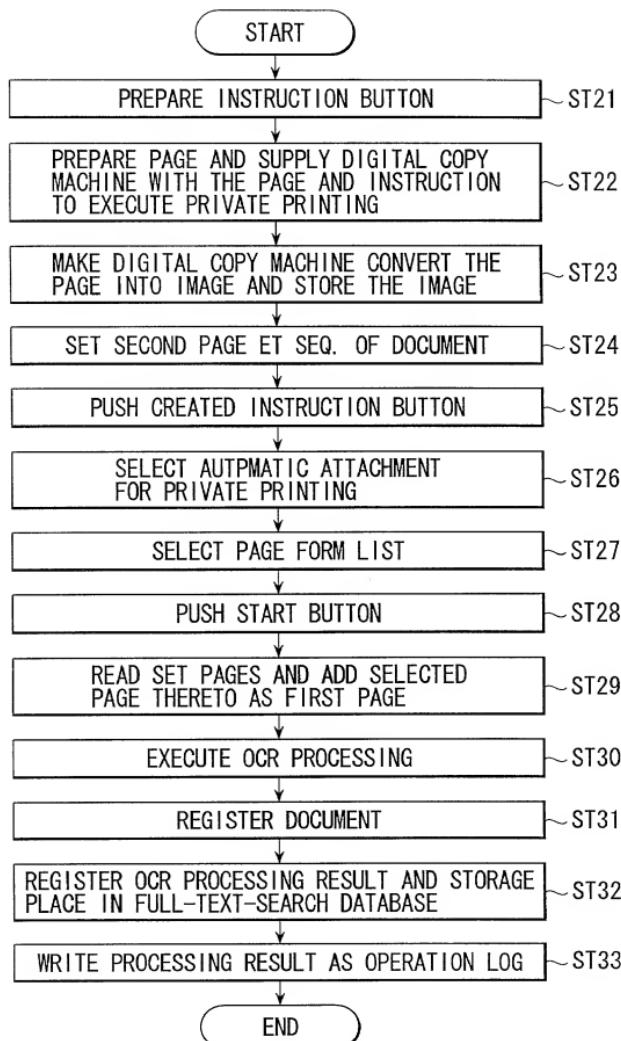


FIG. 12

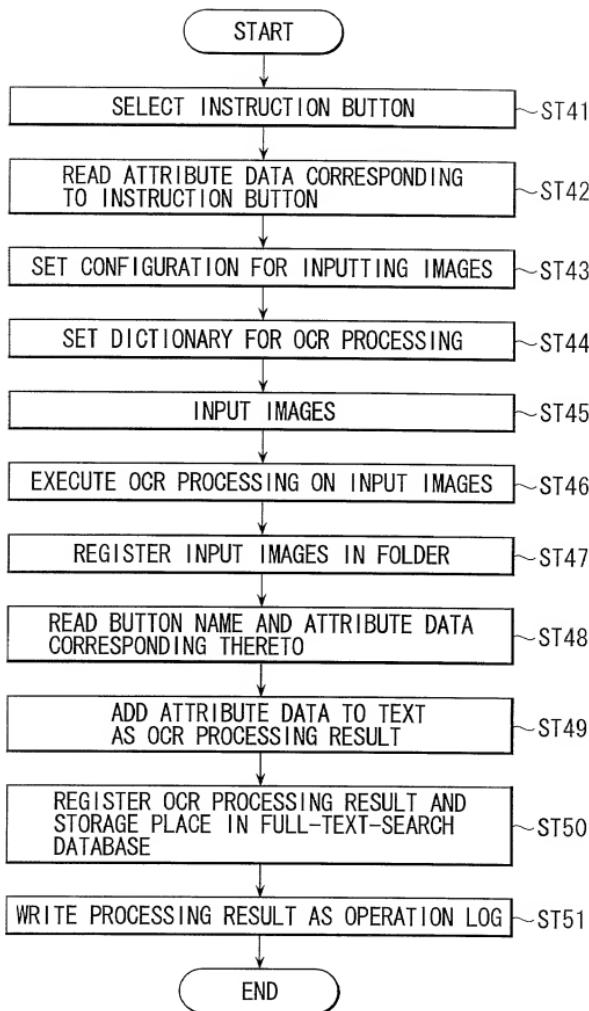


FIG. 13

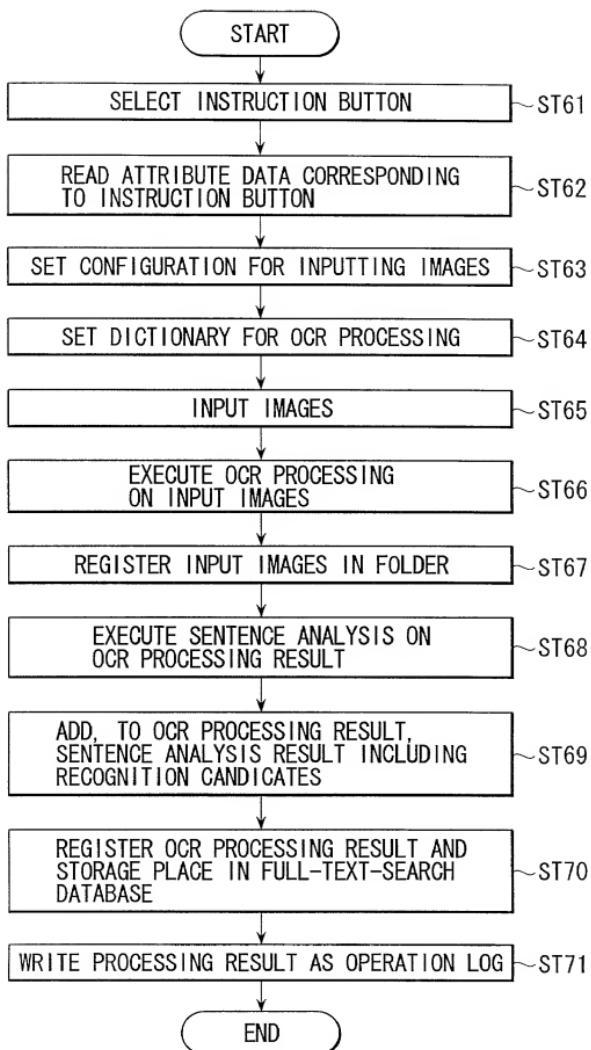


FIG. 14

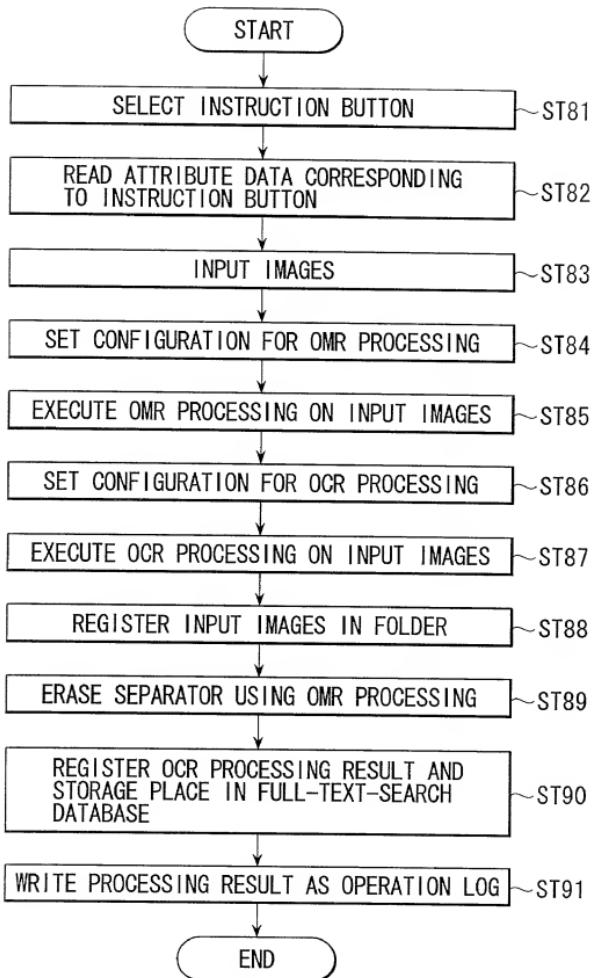


FIG. 15

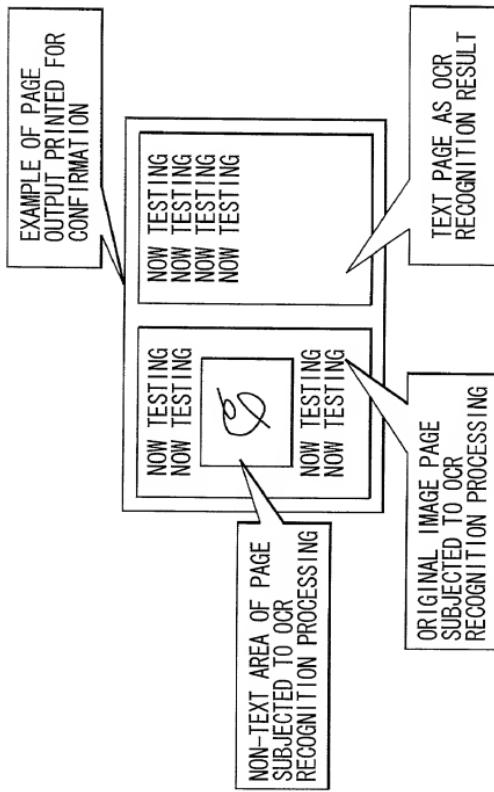


FIG. 16

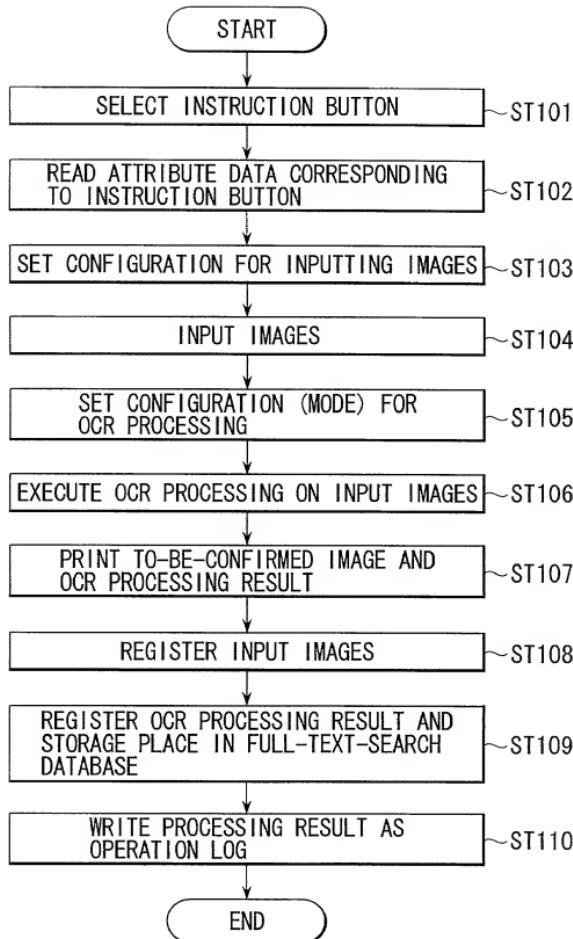


FIG. 17

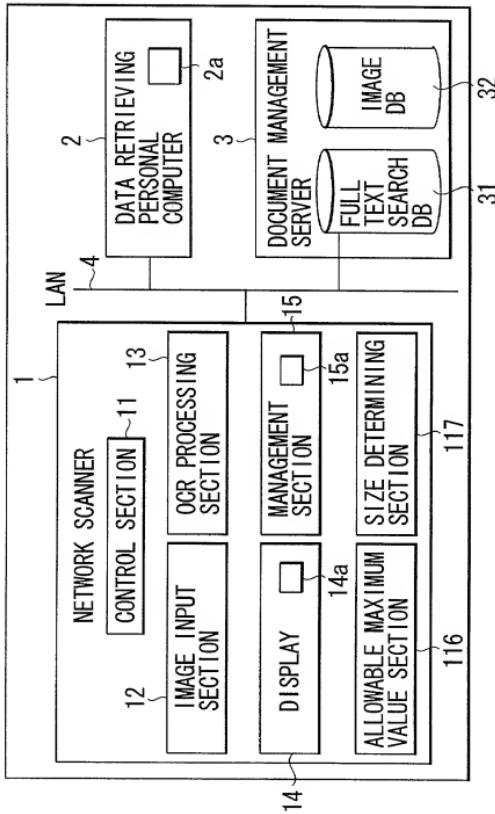


FIG. 18

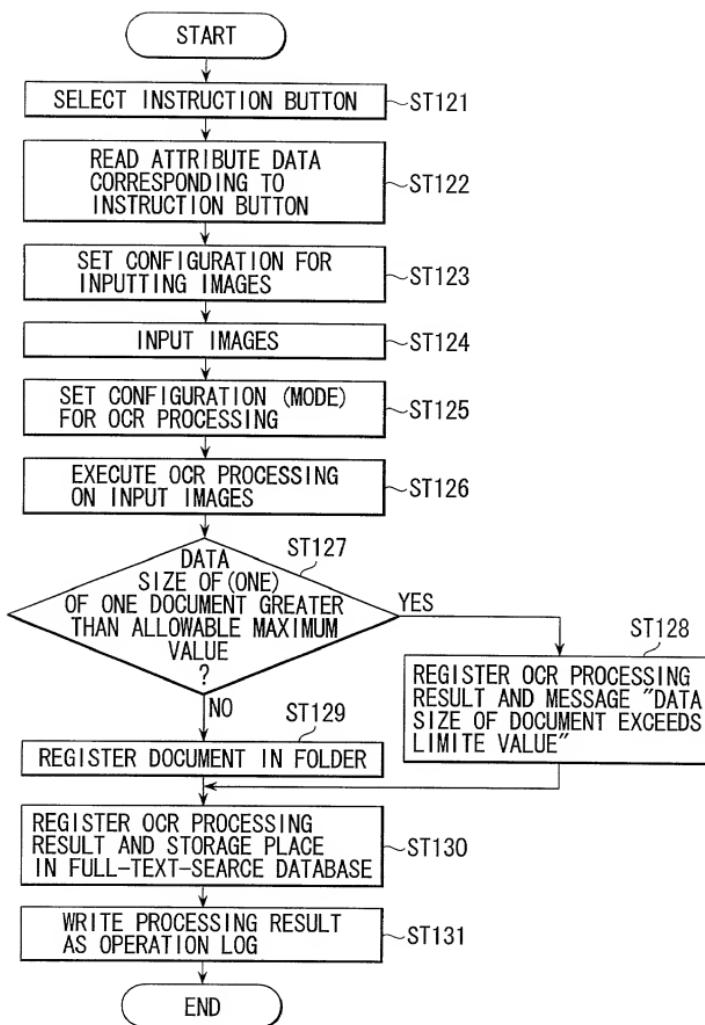


FIG. 19

DATE	EVENT LEVEL	CONTENTS OF OPERATION
1999-10-01@10:10	NORMALLY TERMINATED	DOCUMENT WAS REGISTERED IN BUSINESS DAILY REPORT (YAMADA).
1999-10-01@10:15	WARNING	SINCE INPUT IMAGE SIZE EXCEEDED ALLOWABLE SIZE (2MB), ONLY OCR PROCESSING RESULT WAS REGISTERED IN BUSINESS DAILY REPORT (YAMADA).

FIG. 20

DECLARATION FOR PATENT APPLICATION

00S0189

As a below named inventor, I declare:
that I verily believe myself to be the original, first and sole (if only one individual inventor is listed below) or an original, first and joint inventor (if more than one individual inventor is listed below) of the invention in

INFORMATION INPUT DEVICE

the specification of which is attached hereto unless the following box is checked.

was filed on _____ as United States Application
or PCT International Application No. _____, and
was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information of which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 35 U.S.C. 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

<u>Country</u>	<u>Category</u>	<u>Application No.</u>	<u>Filing Date</u>	<u>Priority Claim</u>
Japan	Patent	11-301400	October 22, 1999	Yes

And I hereby appoint Stephen A. Bent (Reg. No. 29,768), David A. Blumenthal (Reg. No. 26,257), William T. Ellis (Reg. No. 26,874), John J. Feldhaus (Reg. No. 28,822), Patricia D. Granados (Reg. No. 33,683), John P. Isacson (Reg. No. 33,715), Eugene M. Lee (Reg. No. 32,039), Richard Linn (Reg. No. 25,144), Peter G. Mack (Reg. No. 26,001), Brian J. McNamara (Reg. No. 32,789), Sybil Meloy (Reg. No. 22,749), George E. Quillin (Reg. No. 32,792), Colin G. Sandercock (Reg. No. 31,298), Bernhard D. Saxe (Reg. No. 28,665), Charles F. Schill (Reg. No. 27590), Richard L. Schwab (Reg. No. 25,479), Arthur Schwartz (Reg. No. 22,115) and Harold C. Wegner (Reg. No. 25,258), each of whose address is Suite 500, 3000 K Street, N.W., Washington, D.C. 20007-5109, or any one of them, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent & Trademark Office connected therewith, and request that correspondence be directed to Foley & Lardner, Suite 500, 3000 K Street, N.W. Washington, D.C. 20007-5109.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DECLARATION FOR PATENT APPLICATION

I declare further that my citizenship, residence and post office address are as stated below next to my name:

Inventor: (Signature)

Date

Besidence and post office address

Date: SEP. - 8. 2000

Date: _____

1-22-8, Tsunishi, Kamakura-shi,
Kanagawa-ken, Japan

Nobuhisa Yoda

SEP. - 8.2000

Date: _____

1402, View Court Kominato 3 Goto,
1-2, Kominatocho 1-chome, Naka-ku,
Yokohama-shi, Kanagawa-ken, Japan

Tatsuwa Honoguchi

Date:

Citizen of: Japan

Datasets

Citizens of: Japan

Data

Citizen of: Japan

B-1

Gittler et al. / Lungs

七

Guidelines for Authors

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

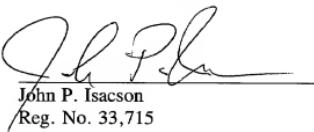
Applicant: Nobuhisa YODA *et al.*
Title: INFORMATION INPUT DEVICE
Appl. No.: Not yet assigned
Filing Date: September 18, 2000
Examiner: Not yet assigned
Art Unit: Not yet assigned

ASSOCIATE POWER OF ATTORNEY

Sir:

The undersigned attorney of record hereby grants Johnny A. Kumar, Reg. No. 34,649, an associate power with full powers of substitution and revocation to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith.

Respectfully submitted,


John P. Isaacson
Reg. No. 33,715

9-18-00
Date

FOLEY & LARDNER
3000 K Street, NW, Suite 500
P.O. Box 25696
Washington, DC 20007-8696
Telephone: (202) 672-5300
Facsimile: (202) 672-5399